



TLAserX30 / X60 / X120

Laser Scan Micrometers

(130 / 160 / 1120 / 230 / 260 / 2120)

Operator's Manual

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If you have questions regarding your laser scan micrometer system or the information in this manual, please call LaserLinc, Inc. customer service department at 1-888-707-4852.

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Laser Micrometers – Theory of Operation

Laser scan micrometers use a laser light source to measure diameter, gap, position, width, and other dimensions. The light source is focused onto the facets of a rotating mirror that reflects the laser beam into a collimating lens. The lens refracts the beam so that all paths of light from the mirror through the lens emerge parallel to each other. A “focal” lens on the other side of the measurement field focuses the incoming light onto a photocell, generating an analog voltage. When an object is placed in the measurement field, it obstructs the laser beam. When the beam is obstructed, the photocell output voltage is at its lowest level; when unobstructed, the voltage is at its highest level. As the mirror rotates, the beam scans the measurement field from one side to the other. An object in the field obstructs the laser beam, casting a shadow that causes a low output voltage for a period of time that is proportional to the size of the object. Using the speed at which the beam is traversing the measurement field as a reference, the shadow time is converted to an accurate measurement of the object’s size.

Laser Micrometers – Safety Considerations

Be sure to avoid direct exposure of human eyes to laser beams emitted from laser diodes. Even though barely visible and/or invisible to the human eye, they can be quite harmful. In particular, avoid looking directly into a laser diode or collimated beam along its optical axis when the diode is activated.

LaserLinc, Inc. certifies compliance with U.S. safety regulations (21 CFR Chapter I, Subchapter J) on laser products, as stipulated by the U.S. Department of Health and Human Services. The LaserLinc, Inc. products shown here correspond to the category “CLASS II LASER PRODUCT” in the regulation.

The following are warnings and graphic symbols that are adhered to the TLAserX30/X60/X120 scanners.

AVOID EXPOSURE - Laser radiation is emitted from this aperture

Caution - Laser radiation when open.
DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS



WAARSCHUWING
LASER STRALING – KIJK
NIET IN DE STRAAL



Halfgeleider Laser: 600-700nm
Maximum Vermogen Minder Dan 1,0mW
Klas II Laser Produkt

TLAser130™ / 160™ / 1120™ Laser Micrometer

Getting Started

- Be gentle with your scanner, it is a precision optical instrument. Rough treatment can reduce the precision, and the life expectancy of your scanner.

Specifications 130 / 160 / 1120

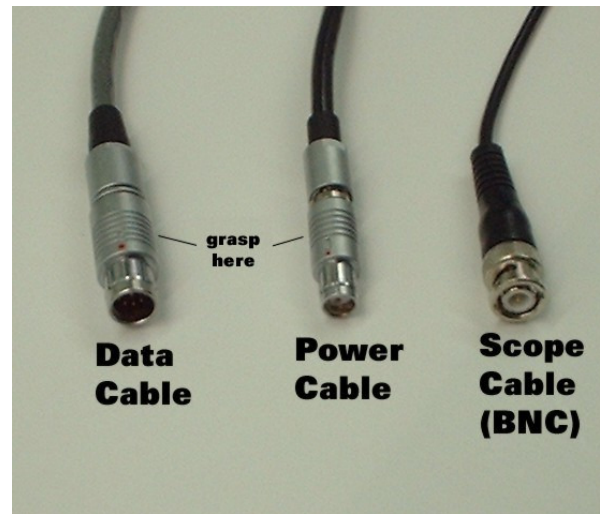
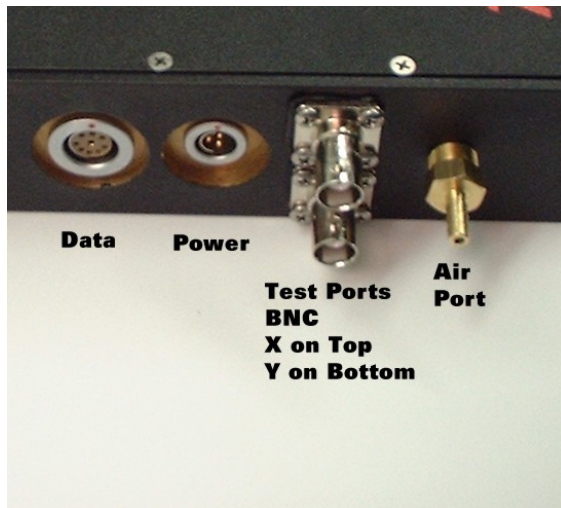
TLAser130s, TLAser160s, and TLAser1120s—Scanners Built for Speed, Accuracy, and Flexibility			
	TLAser130s	TLAser160s	TLAser1120s
Measurement Range	0.007"–1" (0.17mm – 25.4mm)	0.016"–2" (0.25mm–51mm)	0.028"–4.72" (0.71mm–102mm)
Maximum Measurement Size	1.18" (30mm)	2.36" (60mm)	4.72" (120mm)
Measurements per second	1,600 standard 4,000 optional	1,600 standard 4,000 optional	1,600 standard 4,000 optional
Resolution	.000001" (.025µm)	.000001" (.025µm)	.000001" (.025µm)
Repeatability			
Single Scan	±0.002" (±0.0508mm)	±0.004" (±0.102mm)	±0.008" (±0.203mm)
Two Second	±0.00001" (±.25µm)	±0.00002" (±0.5µm)	±0.00004" (±1.0µm)
Positional Error	±0.0001" (±2.54µm)	±0.0002" (±5µm)	±0.0004" (±10µm)
Approx. Dimensions (H x W x D)			
Transmitter	4.95" x 8.75" x 2" (126mm x 222mm x 51mm)	7.5" x 8.5" x 2" (191 x 216 x 51mm)	10.25" x 10.7" x 2" (260 x 272 x 51mm)
Receiver	4.95" x 4" x 2" (126mm x 102mm x 51mm)	7.5" x 4" x 2" (191 x 102 x 51mm)	10.25" x 6.5" x 2" (260 x 165 x 51mm)
Weight	11.5 lbs (5.2 kg)	16 lbs (7.25kg)	21 lbs (9.5kg)
Power is received from AC cord plugged into 110-220VAC 50-60Hz 1-phase electric. Laser Class II visible red laser diode wavelength 670 NM.			
Optional air purges ensure reliable operation in harsh environments; other accessories include roller guides, stands, mounting rails, and calibration fixtures.			

Mounting TLAser130 / 160 / 2120

- Mounting Hole Drawings –
http://www.laserlinc.com/gauge_info/LaserLinc-TLAser130_mount.pdf
http://public.laserlinc.com/info/160s/160s_mounting_dimensions.pdf
http://public.laserlinc.com/info/1120s/1120s_Mounting_Dimensions.PDF
- Orientation - Any orientation is acceptable, as long as the mounting is secure and free from vibration.

Cabling 130 / 160 / 1120

Typical Connectors 130 / 160 / 1120



- Power and Data – both are keyed, and cannot be connected incorrectly. Connectors (plugs), if oriented correctly, will slide snugly into sockets. To remove, grasp metal plug housing and pull directly away from scanner. Plugs should slide out. The connection is snug, not tight. If the plug does not pull out fairly easily, you are not grasping the plug in the correct place; refer to illustration and try again.
- Test Ports – The test ports are designed for waveform output to an oscilloscope. The connection is via BNC connector. For a discussion of the waveforms, see FAQ and Troubleshooting below. The AIR PORT is not applicable on the 130 / 160 / 1120. A separated air purge is available.
- The air purge has multiple purposes; 1) it provides a smaller aperture from which the laser light is emitted and received, thus preventing splashing fluids from contaminating the windows, 2) provides a positive outward air pressure to the windows to prevent contaminants from accumulating on the windows. It is imperative that 'clean dry shop air' be used to prevent moisture and oil from collecting on the windows, 3) it provides protection to the windows from unwieldy product as it passes through the scan field; such as 'end of spool' conditions.

TLAser230™ / 260™ / 2120™ Laser Micrometer

Getting Started

- Be gentle with your scanner, it is a precision optical instrument. Rough treatment can reduce the precision, and the life expectancy of your scanner.

Specifications 230 / 260 / 2120

	TLAser230	TLAser260	TLAser2120
Measurement Range	.007" – 1" (.17mm – 25.4mm)	.016" – 2" (.4mm – 51mm)	.028" – 4" (.7mm – 102mm)
Measurements Per Second	3200 (1600 per axis) standard or 8000 (4000 per axis) optional		
Resolution	.000001" (.025µm)	.00001" (.25µm)	.00001" (0.25µm)
Repeatability (Single Scan)*	±.002" (±.05µm)	±.004" (±.1µm)	±.008" (±0.2µm)
Repeatability (Two Second)*	±.00001" (±.25µm)	±.00002" (±.5µm)	±.00004" (±1µm)
Linearity*	±.00003" (±0.75µm)	±.00006" (±1.5µm)	±.0001" (±2.5µm)
Max. Measurement Size	1.18" (30mm)	2.36" (60mm)	4.72" (120mm)
Dimensions (H x W x D)	10.75" x 13.25" x 2.15" (273 x 337 x 55mm)	19" x 18" x 3" (478 x 447 x 76mm)	22" x 20.25" x 3" (561 x 514 x 76mm)
*Repeatability and linearity apply within the measurement range.			

Power is received from AC cord plugged into 110-220VAC 50-60 Hz, 2-phase electric. Laser Class II visible red laser diode wavelength 670 NM

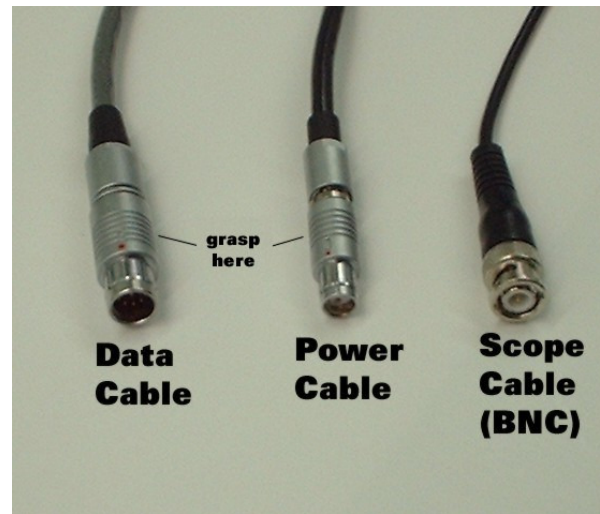
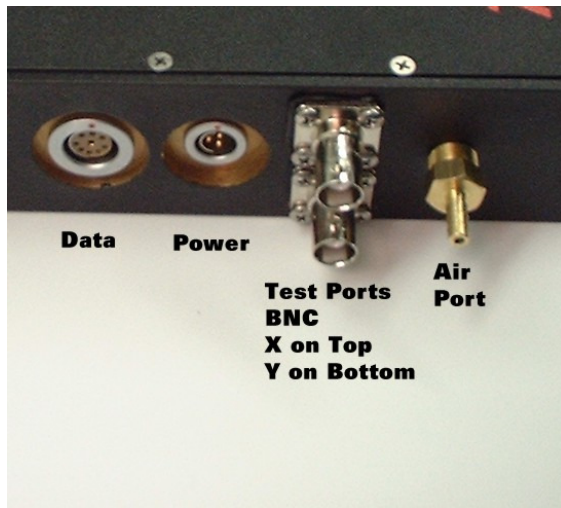
Optional air purges ensure reliable operation in harsh environments; other accessories include roller guides, stands, and calibration fixtures.

Mounting TLAser230 / 260 / 2120

- Mounting Hole Drawings –
- http://public.laserlinc.com/info/230/230_Mounting_dimensions.pdf
- http://public.laserlinc.com/info/260/260_mounting_dimensions.pdf
- http://public.laserlinc.com/info/2120/2120_Mounting_Dimensions.PDF
- Orientation - Any orientation is acceptable, as long as the mounting is secure and free from vibration.

Cabling 230 / 260 / 2120

Typical Connecters 230 / 260 / 2120



- Power and Data – both are keyed, and cannot be connected incorrectly. Connectors (plugs), if oriented correctly, will slide snugly into sockets. To remove, grasp metal plug housing and pull directly away from scanner. Plugs should slide out. The connection is snug, not tight. If the plug does not pull out fairly easily, you are not grasping the plug in the correct place; refer to illustration and try again.
- Test Ports – The test ports are designed for waveform output to an oscilloscope. The connection is via BNC connector. For a discussion of the waveforms, see FAQ and Troubleshooting below. The AIR PORT is not applicable on the 130 / 160 / 1120. A separated air purge is available.
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Preventive Maintenance & Troubleshooting

TLAserX30 / X60 / X120 Cleaning and Routine Maintenance

- Cleaning – The windows of the TLAserX30/X60/X120 must always be clean to ensure the highest measurement accuracy. To clean the windows:
 1. Remove the air purge or air purge if applicable.
 2. Inspect the windows for specks of dirt or (especially) metal. If the scanner is powered, any specks of dirt should “glow” under the illumination of the laser. Any loose dirt should be blown off of the windows. If loose dirt, especially metal, is wiped across the windows, scratching may result. If ‘lung power’ is not adequate, try “canned air” or compressed air. Do not use excessive air pressure. You do not want to scour the window, just blow off any loose dirt.
 3. Clean each of the two, four or six windows with a cotton swab or Kim-wipe damp (not dripping) with Windex, ethanol (denatured is fine), or reagent acetone. If acetone is used, exercise caution to see that it is applied only to the windows. Acetone is a strong solvent, and will dissolve plastic and paint including the silk-screened logo on the scanner. Remember, the wipe or swab should be DAMP not DRIPPING.
 4. Wipe each window once, from side to side. Do NOT scrub. Do not wipe from top to bottom.
 5. Use a new swab or wipe for each window.
 6. If Windex is used, a dry swab or wipe will be necessary to dry the window (again, from side to side, once.... DO NOT SCRUB). All other cleaners (solvents) will dry quickly on their own. Windex will leave spots if allowed to dry on its own.
 7. Replace the air purge or air purge if applicable.
 8. There are no user-serviceable parts inside scanners – removing cover will void warranty.

Troubleshooting and FAQs

- Troubleshooting
 - **Problem:** Total Vu measurement reports “Too Few: 4”
 - **Possible Causes:**
 1. There is no part in the field. Check that the part is in the field and illuminated by the laser. Check each axis, via the test port, for correct waveform.
 2. One axis is completely obstructed. Check that there is nothing obstructing either axis. Check each axis, via the test port, for correct waveform.
 - **Problem:** Total Vu measurement reports “Too Few: 6”
 - **Possible Cause:**
 1. The part is in the field in one axis, but not the other. Check each axis, via the test port, for correct waveform.
 - **Problem:** Total Vu measurement reports “Too Few: 0”
 - **Possible Causes:**
 1. The laser field is obstructed. Check that the air purge is completely inserted into the scanner. Check each axis, via the test port, for correct waveform.

- **Problem:** Total Vu measurement reports “Too Many: (any number > 8)”
- **Possible Causes:**
 1. There is dirt on a window. Remove the air purge and inspect for spots, dots, or glowing flecks on any of the windows. Follow the window cleaning procedure described earlier in this document. Check each axis, via the test port, for correct waveform.
 2. There is more than one part in the field. Check for lint attached to the air purge. Check for any additional fibers in the scan field. Check each axis, via the test port, for correct waveform.
- **Problem:** Total Vu measurement reports “No Scan”
- **Possible Causes:**
 1. The scanner is not powered. Check that the power cord is completely plugged in at both ends, and that it is not plugged into a dead circuit (e.g. a power strip that is turned off).
 2. The scanner data cable is not connected. Check that the scanner data cable is plugged into the scanner, and into the TLAser400 in the PC.
- **Problem:** There are many problems that are not related to the scanner.
- **Possible Causes:**
 1. Please contact LaserLinc for further help.